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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BARTH, VINCENT P

ART UNIT PAPER NUMBER

2877

DATE MAILED: 02/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/664,232

Applicant(s)

KNIGHTON ET AL.

Examiner

Vincent P. Barth

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5, 6, 8-10, 15, 16 and 19-22 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 7, 11-14, 17 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 5, 6, 8-10, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chlestil, U.S. Pat. No. 4,302,097 (24 Nov. 2004), in view of Ban, et al., U.S. Pat. No. 6,775,403 (10 Aug. 2004).

3. Referring to Claims 1, 2 and 5, Chlestil discloses creating a three-dimensional representation of an object H (for example, a human head) by a first silhouette method, in which two mirrors 2 and 3 direct silhouettes from two screens 4 and 5 into an imaging camera 1 (Fig. 1). Chlestil discloses creating a three-dimensional representation of an object H by a second contour line projection method, in which light projectors 10, 13 and 21 impinge on the object H, and are imaged by cameras 2 and 3 (Fig. 1). Chlestil discloses that each method is for the recording of shape related data (col. 3, ln. 44), which is used to form a solid representation in sculpting material (col. 1, lns. 54-56), thus the first and second methods of image capturing each derive 3D data, and the system is designed to either use the two methods separately, or combine them (col. 1, ln. 45 to col. 2, ln. 64). Chlestil discloses that the object H is moved relative to the imaging devices around an axis of rotation O (Fig. 1). Applicants have amended the claims to

Art Unit: 2877

include capturing the two-dimensional imaging data and then deriving a three-dimensional “digital” representation of the object. In this connection, Applicants have argued in the reply to the previous Office Action (Remarks dated 14 Dec. 2004, pg. 7, 3d para.) that only a physical object may be tooled from image data. However, Chestil explicitly discloses that the two-dimensional images may be captured from a television camera (col. 2, ln. 38), which those in the art would understand to be typically a digital camera. Moreover, Chestil discloses that the two-dimensional images may be stored in an electronic medium (col. 2, lns. 15-19), thus explicitly suggesting that the two-dimensional data is in such digital form for deriving a three-dimensional representation (rather than a only a physical model, as argued by Applicants). Even assuming *arguendo* that the Chestil reference only contemplated deriving a 3D physical model from the digital 2D stored images, it has also been known to derive a 3D digital representation of an object from at least two 2D digital image representations. For example, Ban discloses a system for processing 3D shape data, in which a first 2D image capture process forms an image of the object (Fig. 4, step ST10), and in which a second 2D image capture process forms an image of the object (Fig. 4, step ST116), and from which a 3D representation of the object is derived (Fig. 4, step ST 18). Chestil and Ban are analogous art, since they are from a similar problem solving area, in that each involves creating a 3D representation of an object from multiple 2D digital images of said object. See Medtronic, Inc. v. Cardiac Pacemakers, 721 F.2d 1563, 1572-1573, 220 USPQ 97, 103-104 (Fed. Cir., 1983). The motivation for combining the reference would have been to provide a digital 3D representation of an object from the digital 2D images when a physical model might not be desired. Accordingly, it would have been obvious to those skilled in the art to combine the references, at the time of the invention, in order to obtain such benefit.

Art Unit: 2877

Applicants have also amended Claims 2 and 5 to include the limitation in which combining the elements are performed automatically. However, MPEP §2144.04(III) cites In re Venner, 262 F.2d 91, 95, 120 USPQ 193, 194 (CCPA 1958) for the proposition that automating a manual activity is not patentably distinguishable over the prior art. Thus, Applicants must provide particular steps in such automation that are not known in the art, rather than merely stating that the process is automated.

4. Referring to Claims 6 and 10, Chlestil does not explicitly identify either the contour line method as active ranging, or the silhouette method as passive imaging. However, those of ordinary skill in the art generally consider contour line 3D mapping as an active approach, in that structured lines impinge on the subject, and the silhouette method as a passive approach, since the camera merely images a view of subject which blocks the lighting source.

5. Referring to Claims 8 and 9, Chlestil discloses creating a three-dimensional representation of an object H (for example, a human head) by a first silhouette method, in which two mirrors 2 and 3 direct silhouettes from two screens 4 and 5 into an imaging camera 1 (Fig. 1). Chlestil discloses creating a three-dimensional representation of an object H by a second contour line projection method, in which light projectors 10, 13 and 21 impinge on the object H, and are imaged by cameras 2 and 3 (Fig. 1). Chlestil discloses that each method is for the recording of shape related data (col. 3, ln. 44), which is used to form a solid representation in sculpting material (col. 1, lns. 54-56), thus the first and second methods of image capturing each derive 3D data, and the system is designed to either use the two methods separately, or combine them (col. 1, ln. 45 to col. 2, ln. 64). Chlestil discloses that the object H is moved relative to the imaging devices around an axis of rotation O (Fig. 1). Chlestil does not explicitly use the term

Art Unit: 2877

“digitizer” with respect to the system, nor is a processor explicitly shown to combine the data.

However, Chlestil explicitly discloses that the image data may be recorded by electronic means, or imaged with a television camera (col. 2, lns. 15-19; col. 2, ln. 38). Therefore, those of skill in the art reading the Chlestil disclosure presently would interpret the reference as suggesting a digital system, including modern processors, since computer processors were available at the time of invention and used in video processing.

6. Referring to Claims 15 and 16, Chlestil discloses all of the limitations claimed, but does not explicitly disclose that a plurality of lens and aperture combinations is used, or that such lenses are contained in a lens barrel. Chlestil discloses cameras 1, 8, and 16 both generically and as television cameras, thus leaving latitude to those practicing the invention to use alternative embodiments understood by those in the art to be within the scope of the disclosure. Cameras, including television cameras, have been well known to those of ordinary skill in the art to be fitted with image sensor arrays and a plurality of lenses and apertures, such that those imaging a subject may have a choice to optimize the image quality by selecting a suitable lens/aperture combination. See MPEP §2144.03. Moreover, since Chlestil discloses cameras, implicit in such disclosure is that the cameras have at least a lens with a barrel to contain such lens. See MPEP §2144.01.

7. Referring to Claims 19 and 21, Chestil does not explicitly disclose that the capture methods may be performed by the same image sensing arrays (i.e., cameras or the like). However, MPEP§ 2144.04(A)(II) states that omission of an element and its function is obvious if not desired, citing In re Kuhle, 526 F.2d 553, 188 USPQ 7 (CCPA 1975). Thus, in the instant

Art Unit: 2877

context, using a single camera to create multiple images instead of using a plurality of cameras would have been obvious to those skilled in the art at the time of the invention.

8. Referring to Claims 20 and 22, Chestil does not explicitly disclose that one of the capture methods may be stereoscopy. However, stereoscopy has been well known in the art as a means of simulating a 3D representation of an object. In this connection, the allowable subject matter in Claims 7 and 11 indicated below results from a combination of a first capture method of intensity gradient ranging and a second capture method of stereoscopy, in combination with the remaining limitations in the claim. By contrast, Claims 20 and 22 do not provide such combination, but merely stereoscopy, which has been well known in the art.

Allowable Subject Matter

9. Claims 3, 4, 7, 11-14, 17 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, since the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations set forth therein.

10. Referring to Claim 3, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby capturing with the capturing device an intensity gradient based 3D representation, in combination with the remaining limitations in the claim. Referring to Claim 4, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby capturing comprises the use of a linear sensor array, in combination with the remaining limitations in the claim. Referring to Claim 7,

Art Unit: 2877

the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby the first capture method is intensity gradient ranging and the second capture method is stereoscopy, in combination with the remaining limitations in the claim. Referring to Claim 11, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby the first capture method is intensity gradient ranging and the second capture method is stereoscopy, in combination with the remaining limitations in the claim. Referring to Claim 12, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby a gravitational orientation unit is responsive to gravity, in combination with the remaining limitations in the claim. Referring to Claim 13, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby a gravitational orientation unit responsive to the relative orientation of gravity comprises a pendulum having a reflective element mounted thereon, in combination with the remaining limitations in the claim. Claim 14 is allowable based on its dependency upon the claim from which it is dependent. Referring to Claim 17, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby the digitizer comprises a spring to bias the shaft relative to the housing, in combination with the remaining limitations in the claim. Claim 18 is allowable based on its dependency upon the claim from which it is dependent.

CONCLUSION

11. Applicants' Claims 1, 2, 5, 6, 8-10, 15, 16 and 19-22 are rejected based on the reasons set forth above.

12. Applicants' Claims 3, 4, 7, 11-14, 17 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

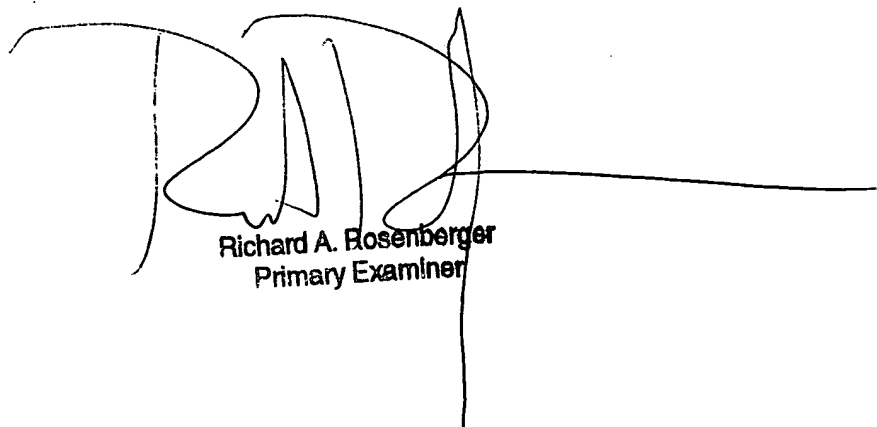
14. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

15. Any inquiries concerning this communication from the Examiner should be directed to Vincent P. Barth, whose telephone number is 571-272-2410, and who may be ordinarily reached from 9:00 a.m. to 5:30 p.m., Monday through Friday. The fax number for the group before final actions is 703-872-9306.

16. If attempts to reach the Examiner prove unsuccessful, the Examiner's supervisor is Gregory J. Toatley, Jr., who may be reached at 571-272-2800, ext. 77.

Art Unit: 2877

17. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Richard A. Rosenberger
Primary Examiner